

The opinion in support of the decision being entered today  
is *not* binding precedent of the Board

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* RISTO OLAVI HARJULA,  
JOHANNA TERESIA MOLLER, SUHEEL AMIN, ALAN DYER,  
MARTYN PILLINGER, JONATHAN ANDREW NEWTON,  
ESKO HEIKKI TUSA, and MAURICE WEBB

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Appeal 2007-3543  
Application 10/675,138  
Technology Center 1700

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Decided: September 11, 2007

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Before CHUNG K. PAK, CHARLES F. WARREN, and  
THOMAS A. WALTZ, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

DECISION ON APPEAL

Applicants appeal to the Board from the decision of the Primary Examiner finally rejecting claims 2 through 4, 7, 9, 10, 17, 18, and 20 through 22 in the Office Action mailed January 25, 2006, and refusing to allow claim 19 subsequently amended. 35 U.S.C. §§ 6 and 134(a) (2002); 37 C.F.R. § 41.31(a) (2006).

We reverse the decision of the Primary Examiner.

Claims 17 and 22 illustrate Appellants' invention of a method of extracting metal ions from an aqueous solution, and are representative of the claims on appeal:

17. A method of extracting metal ions from an aqueous solution comprising contacting the aqueous solution with a material consisting essentially of antimony silicate doped with one or more elements selected from the group consisting of tungsten, niobium, and tantalum which material has been obtained by reacting together in a liquid medium a silicon containing compound, an antimony containing compound and a compound containing one or more of the elements in the presence of an acid.

22. A method of extracting metal ions from an aqueous solution comprising contacting the aqueous solution with a material consisting essentially of antimony silicate doped with one or more elements selected from the group consisting of tungsten, niobium, and tantalum.

The Examiner relies on the evidence in these references:

Dietz	US 5,888,398	Mar. 30, 1999
Bedard	US 5,858,243	Jan. 12, 1999

Appellants request review of the following grounds of rejection advanced on appeal (Supp. Br. 7-8):

Claim 22 under 35 U.S.C. § 102(e) as anticipated by Bedard (Answer 3);

Claims 2 through 4, 17 through 19, and 22 under 35 U.S.C. § 103(a) as unpatentable over Bedard (*id.* 3-4); and

Claims 7, 9, 10, 20, and 21 under 35 U.S.C. § 103(a) as unpatentable over Bedard as applied and further in view of Dietz (*id.* 3-4).

We decide this appeal based on independent claims 17 and 22, the remaining claims dependent on claim 17. 37 C.F.R. § 41.37(c)(1)(vii) (2006).

The dispositive issues are the interpretation to be made of the language “a material consisting essentially of antimony silicate doped with

one or more elements selected from the group consisting of tungsten, niobium, and tantalum” in claim 22, and the same language coupled with a specified process for preparing the same in claim 17; and whether Bedard would have *prima facie* described this material to one skilled in the art or suggested this material to one of ordinary skill in the art.

The Examiner contends one of ordinary skill in the art would have “at once envisaged a mixture of antimony and niobium or tantalum as the metal component of the . . . silicate material” disclosed by Bedard as Appellants have “not shown that the presence of titanium in the recited material would materially change the characteristics” of the claimed material (Answer 3, citing Bedard, col. 2, ll. 59-61; original emphasis omitted). The Examiner further contends one of ordinary skill in the art would have selected “a combination of antimony with niobium or tantalum as constituent ‘M’ in [Bedard], since this reference clearly suggests such a mixture of elements;” and would have employed “a silicon compound, an antimony compound, and a compound of niobium or tantalum to prepare this reference material, since this reference material (i.e. crystalline silicate) clearly requires the presence of silicon, antimony and niobium or tantalum” (*id.* 3-4). The Examiner contends one of ordinary skill would have used silicic acid as the silicon compound (*id.* 4). In response to Appellants’ arguments, the Examiner contends “the terms ‘molecular sieve’ and ‘silicate’ are not mutually exclusive,” “[m]olecular sieves are very often silicates (e.g. aluminosilicates),” and “the molecular sieve material of Bedard clearly contains silicon bonded to oxygen (see the formula in line 53 of col. 2); [sic] and therefore, this reference material is deemed to be a silicate” (*id.* 5). The

Examiner contends “[s]ince this reference silicate can also contain antimony (see col. 2, line 60), it is deemed to be an antimony silicate,” and “since this reference silicate can also contain niobium and/or tantalum in combination with this antimony (see col. 2, line 60), it is deemed to be an antimony silicate doped with niobium and/or tantalum” (*id.*).

Appellants contend Bedard’s material can “not be described as an antimony silicate because it requires the presence of an alkali metal” and is thus “a molecular sieve as it contains potassium or sodium salt,” citing, “A in the formula in column two” (Supp. Br. 11; original emphasis omitted). Appellants contend “[t]he dopants of claim 22 are dopants in the silicate of antimony silicate, not replacements for antimony,” and Bedard’s material “is a doped sodium or potassium salt, not a doped antimony salt” (*id.* 11). Appellants contend the “portion of the formula shown in column 2, lines 26 and 54 and in particular that portion . . . {M(x)Ti(1-x)Ge(y)}” show that “titanium must always be present, pointing out “[f]or example, when y is . . . 0, then M and titanium are present in equal amounts,” and “[w]hen y . . . [is] 0.75, the Ge plus titanium likewise are there” (*id.* 11). Appellants find that in Bedard’s working examples, the molecular sieves contain “a substantial amount of titanium . . . [and] do not contain antimony silicate” (*id.* 11-12). Appellants contend the claim language “consisting essentially of” “excludes titanium from antimony silicate doped” as claimed, which position is supported by the evidence in Dr. Minihan’s Declaration<sup>1</sup> showing “that poor

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<sup>1</sup> Appellants submitted Dr. Minihan’s “Declaration under 37 CFR 1.132” (Minihan Declaration) with the amendment filed May 10, 2006, which declaration was entered and considered by the Examiner even though the

results were obtained utilizing titanium doped antimony silicate” and thus that “titanium has a materially detrimental effect on antimony silicate being able to extract metal ions in an aqueous solution” (*id.* 12-13; *see also* Reply Br. 2-3). With respect to the process for preparing doped antimony silicate specified in claim 17, Appellants contend “the working examples of [Bedard] indicate that the reaction to prepare the molecular sieve is performed in media that has a pH of about 12” and claim 17 specifies “the use of an acid” (*id.* 14; original emphasis omitted).

We interpret claims 17 and 22 by giving the terms thereof the broadest reasonable interpretation in their ordinary usage in context as they would be understood by one of ordinary skill in the art, in light of the written description in the Specification unless another meaning is intended by Appellants as established therein, and without reading into the claim any disclosed limitation or particular embodiment. *See, e.g., In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364, 70 USPQ2d 1827, 1830 (Fed. Cir. 2004); *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1666-667 (Fed. Cir. 2000); *In re Morris*, 127 F.3d 1048, 1054-055, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

The plain language of claim 22 specifies a method of extracting metals comprising at least contacting an aqueous solution with any amount of any material consisting essentially of antimony silicate doped with one or more elements selected from the group consisting of tungsten, niobium, and

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amendment was denied entry in the Advisory action mailed June 6, 2006. We note Appellants filed the Notice of Appeal on June 22, 2006.

tantalum. The transitional term “comprising” opens claim 22 to encompass methods that include any amount of material which can extract metals from an aqueous solution in addition to the specified material containing at least doped antimony silicate. *See, e.g., Exxon Chem. Pats., Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1555, 35 USPQ2d 1801, 1802 (Fed. Cir. 1995) (“The claimed composition is defined as comprising - meaning containing at least - five specific ingredients.”); *In re Baxter*, 656 F.2d 679, 686-87, 210 USPQ 795, 802-03 (CCPA 1981) (“As long as one of the monomers in the reaction is propylene, any other monomer may be present, because the term ‘comprises’ permits the *inclusion* of other steps, elements, or materials.”).

In considering the language “material consisting essentially of antimony silicate doped with one or more elements selected from the group consisting of tungsten, niobium, and tantalum,” we point out the claim term “consisting essentially of” is used in claim construction to indicate, for example, that “the invention necessarily includes the listed ingredients and is open to unlisted ingredients that do not materially affect the basic and novel properties of the invention.” *See, e.g., PPG Indus., Inc. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353-354 (Fed. Cir. 1998). Thus, the interpretation of the “material” in this instance requires a determination of whether any other components or ingredients in addition to the specified doped antimony silicate would materially affect the basic and novel characteristics of that “material” because this phrase customarily excludes such components and ingredients. *See In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976) (explaining *Ex parte Davis*,

80 USPQ 448 (Pat. Off. Bd. App. 1948)). In arriving at this determination, the written description in Appellants' Specification must be considered. *Herz*, 537 F.2d at 551-52, 190 USPQ at 463 (“[I]t is necessary and proper to determine whether [the] specification reasonably supports a construction” that would exclude or include particular ingredients.); *see also PPG Indus.*, 156 F.3d at 1354-357, 48 USPQ2d at 1353-356 (Patentees “could have defined the scope of the phrase ‘consisting essentially of’ for purposes of its patent by making clear in its specification what it regarded as constituting a material change in the basic and novel characteristics of the invention. The question for our decision is whether PPG did so.”).

The written description in the Specification invariably uses the open-ended term “comprising” to describe the “material,” including such language as “use of a material comprising antimony silicate as a sorbet” and “a method of preparation of a material comprising antimony silicate, the method comprising reacting together . . .” (Specification ¶¶ 0004 and 0009; *see also*, e.g., ¶¶ 0011, 0013, 0029, 0031, 0032, and 0039). Indeed, there is no disclosure in the Specification which employs the language “consisting essentially of” or sets forth any components or ingredients that would materially affect the basic and novel characteristics of the specified “material.” The Minihan Declaration has no bearing on the interpretation of the claim language in light of the written description in the Specification. Reliance on extrinsic evidence of results obtained with “material” specifically disclosed vis-à-vis material which is related thereto in some respect, such as that set forth in the Minihan Declaration, does not satisfy Appellants' burden to establish that the written description in the

Specification evinces which additional components and ingredients are deleterious to the basic and novel characteristics of the claimed invention and thus, are excluded from the claims by reason of the transitional term “consisting essentially of.” *See PPG Indus.*, 156 F.3d at 1354, 48 USPQ2d at 1353-354; *Herz*, 537 F.2d at 551-52, 190 USPQ at 463.

The “material” as claimed must, of course, contain “antimony silicate doped with one or more elements selected from the group consisting of tungsten, niobium, and tantalum.” We agree with Appellants’ interpretation, as set forth in their contentions, as we find no disclosure in the written description in the Specification which would indicate to one of ordinary skill in this art that the term “antimony silicate” is used in a manner other than as used in the art, and thus, as claimed, it is antimony silicate per se that is doped with one or more of tungsten, niobium, and tantalum. In claim 17, couched in product-by-process format, the additional process language further characterizes the doped antimony silicate as the product prepared from the source compounds in the presence of an acid. *See, e.g., In re Thorpe*, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985).

We find Bedard would have disclosed to one of ordinary skill in the art a process of using specified molecular sieves to remove metal ions from a liquid stream, wherein the molecular sieve falls within the empirical formula  $A_{((4-4n)(n))}(M_xTi_{1-z}Ge_y)_4(Ge_{1-p}Si_p)_qO_r$ , wherein A can be an exchangeable cation and M is niobium, tantalum, antimony, or mixtures thereof (Bedard, e.g., col. 1, ll. 13-17, and col. 2, ll. 42-64). Bedard further discloses “[g]enerally, the hydrothermal process used to prepare the intergrowth molecular sieves . . . involves forming a reaction mixture . . .



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expressed by the formula in terms of mole ratios of the oxides of:  
 $aA_{2/n}O:bM_2O_5:cGeO_2:dTiO_2:eSiO_2:fH_2O$ ,” wherein A and M are as defined  
in the empirical formula (*id.* col. 2, ll. 57-67).

On this record, we agree with Appellants that in applying the disclosed values for the subscripts of Bedard’s empirical and reaction formulae, Bedard’s molecular sieves would contain some amount of an exchangeable cation and titanium. Indeed, the Examiner has not established by scientific reasoning or evidence that either the term “antimony silicate” as reasonably interpreted by one of ordinary skill in this art would include such ingredients, or that Bedard’s formulae would have described to one skilled in the art and would have disclosed to one of ordinary skill in this art antimony silicate doped as claimed in claims 17 and 22.

Accordingly, in the absence of such reasoning and findings, the Examiner has not established a *prima facie* case of anticipation and of obviousness, and thus, we reverse the grounds of rejection under 35 U.S.C. § 102(e) and 35 U.S.C. § 103(a).

The Primary Examiner’s decision is reversed.

REVERSED

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WILLIAM J. SCHRAMM  
REISING ETHINGTON, BARNES, KISSELLE, P.C.  
P.O. BOX 4390  
TROY, MICHIGAN